What is claimed is:

1. A digital branch calibrator for use in an RF transmitter for compensating for phase and/or gain imbalances between two phasor fragment signals in a transmit path from a phasor fragmenter in a digital front end of said transmitter to a power amplification and combining component in an analog front end of said transmitter outputting an RF transmit signal based on a sum of said fragment signals, said calibrator comprising:

(a) a closed loop controller operable during a calibration sequence, defined by a predetermined number of control loop iterations, and comprising transmit and feedback signal paths, said transmit signal path configured for transmitting a zero base band transmit signal and said feedback signal path configured for receiving a feedback signal correlated with a power level of said output RF transmit signal, said transmit signal path comprising a phase and/or gain adjusting component configured for adjusting the phase and/or gain of said phasor fragment signals to minimize said power level, said adjusting being performed iteratively to the end of said calibration sequence and resulting in sequence phase and/or gain update signals, whereby said sequence update signals are provided for updating the phase and/or gain of data signals transmitted through said transmit signal path; and,

(b) digital signal processing means configured for operating said controller and controlling said transmission of said zero base band transmit signal for processing by said calibrator.

2. A calibrator according to claim 1 wherein said closed loop controller further comprises false imbalance removal means for removing from said feedback signal any portion thereof correlating to local oscillator and/or other

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non-imbalance feed through energy at the carrier frequency, said false feedback removal means comprising a digital modulator/demodulator configured for modulating said zero base band signal by a sub-carrier frequency signal and for demodulating said feedback signal.

3. A calibrator according to claim 2 wherein said phase and/or gain adjusting component comprises a complex accumulator configured for decimation of said feedback signal.

4. A calibrator according to claim 3 wherein said phase and/or gain adjusting is performed by alternating iterations of phase adjustments and iterations of gain adjustments.

5. A calibrator according to claim 3 wherein said phase adjusting produces a phase gradient calculated from the magnitude of said feedback signal, the sign of the differential of the phase adjustment from one iteration to the next iteration and the sign of the differential of the magnitude of said feedback signal from one iteration to the next iteration and said gain adjusting produces a gain gradient calculated from the magnitude of said feedback signal, the sign of the differential of the gain adjustment from one iteration to the next iteration and the sign of the differential of the magnitude of said feedback signal from one iteration to the next iteration.

6. A calibrator according to claim 3 wherein said gain update signal(s) are calculated so as to limit the magnitudes of said phasor fragment signals to a predetermined maximum value L and so that the magnitude of at least one of said phasor fragment signals has the value L.

7. An RF transmitter having a LINC architecture and comprising a digital front end with a fragmenter configured for fragmenting an input signal into a

plurality of output fragment signals which sum to said input signal, and an analog front end for amplification and combining of said fragment signals, said transmitter comprising a calibrator according to claim 2 and further comprising an in-phase (I), quadrature-phase (Q) signal pre-balancing component (IQPBAL) in the digital front end transmit path configured for mitigating I/Q phase and/or gain imbalances on each said fragment signal.

8.   An RF transmitter according to claim 7 and further comprising a DC removal component configured for removing DC signal components of said feedback signal, said DC removal component comprising means for estimating the DC signal level and means for removing said DC estimation from said feedback signal.

9.   A method for compensating for phase and/or gain imbalances between two phasor fragment signals in a transmit path of an RF transmitter outputting an RF transmit signal based on a sum of said fragment signals, said method comprising:

(a)   transmitting a zero base band transmit signal along a transmit path during a calibration sequence defined by a predetermined number of iterations;

(b)   receiving a feedback signal correlated with a power level of said output RF transmit signal; and,

(c)   adjusting the phase and/or gain of said phasor fragment signals to minimize said power level, said adjusting being performed iteratively to the end of said calibration sequence and resulting in sequence phase and/or gain update signals, whereby said sequence update signals are provided for updating the phase and/or gain of data signals transmitted through said transmit signal path.

10.   A method according to claim 9 and further including the step of removing from said feedback signal any portion thereof correlating to local oscillator and/or

other non-imbalance feed through energy at the carrier frequency, said removing including modulating said zero base band signal by a sub-carrier frequency signal and demodulating said feedback signal.

11. A method according to claim 10 whereby said phase and/or gain adjusting is performed by alternating iterations of phase adjustments and iterations of gain adjustments.

12. A method according to claim 10 whereby said phase adjusting includes producing a phase gradient calculated from the magnitude of said feedback signal, the sign of the differential of the phase adjustment from one iteration to the next iteration and the sign of the differential of the magnitude of said feedback signal from one iteration to the next iteration and said gain adjusting includes producing a gain gradient calculated from the magnitude of said feedback signal, the sign of the differential of the gain adjustment from one iteration to the next iteration and the sign of the differential of the magnitude of said feedback signal from one iteration to the next iteration.

13. A method according to claim 10 whereby said gain update signal(s) are calculated so as to limit the magnitudes of said phasor fragment signals to a predetermined maximum value L and so that the magnitude of at least one of said phasor fragment signals has the value L.